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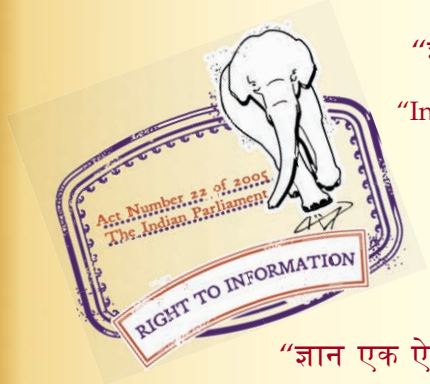
IS 8069 (1989): High density polyethylene (HDPE) woven sacks for packing pesticides [TXD 23: Textile Materials made from Polyolefins]

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"Knowledge is such a treasure which cannot be stolen"

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IS 8069 : 1989
[ Amalgamating IS 8069
( Parts 1 & 2 ) : 1981 ]
( Reaffirmed 2002 )

*Indian Standard*

# HIGH DENSITY POLYETHYLENE ( HDPE ) WOVEN SACKS FOR PACKING PESTICIDES — SPECIFICATION

*( Second Revision )*

भारतीय मानक

## कीटनाशी की भराई के लिये उच्च घनत्त्व पोलिएथाइलीन ( एच. डी. पी. ई. ) के बुने हुये बोरे – विशिष्टि

( दूसरा पुनरीक्षण )

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Price Group 2

## FOREWORD

This Indian Standard ( Second Revision ) was adopted by the Bureau of Indian Standards on 12 September 1989, after the draft finalized by the Textile Materials Made from Polyolefins ( Excluding Cordage ) Sectional Committee had been approved by the Textile Divsion Council.

The sacks covered in the standard are based on present manufacturing practices. For any other construction, extensive field trials are necessary for arriving at a suitable fabric construction. Similarly, in case of thickness of loose liner, if required, extensive field trials are necessary in arriving at specific values.

This standard was first published in 1971. Thereafter, based on extensive trials and the requirements of packing of pesticides as required by the Central Insecticides Board, Directorate of Plant Protection and Quarantine, Faridabad, the standard was revised in 1981 specifying requirements of sacks and bags separately in two parts.

The present revision has been made in the light of the experinence gained in the implementation of the standards since 1981, and it incorporates the following major changes:

a) Opportunity has been taken to amalgamate both the parts with a view to evolve one comprehensive standard covering both the woven bags for packing 5 kg and 10 kg pesticides and woven sacks for packing 25 kg and 50 kg pesticides;

b) HDPE woven sacks made out of circular looms have been covered;

c) Type 1 sacks have been specified for packing 25 kg and 50 kg pesticides and Type 2 sacks for packing 5 kg and 10 kg pesticides;

d) The requirements for liner have been modified; and

e) Fabric construction has been added for tubular woven sacks.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* ).' The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# *Indian Standard*

# HIGH DENSITY POLYETHYLENE ( HDPE ) WOVEN SACKS FOR PACKING PESTICIDES — SPECIFICATION

## *( Second Revision )*

### 1 SCOPE

**1.1** This standard prescribes the requirements of two types of HDPE woven sacks for packing pesticides. Type 1 is suitable for packing 25 kg and 50 kg pesticides and Type 2 is suitable for packing 5 kg and 10 kg pesticides.

### 2 REFERENCES

**2.1** The following Indian Standards are necessary adjuncts to this standard:

| *IS No.* | *Title* |
|---|---|
| IS 1969 : 1985 | Method for determination of breaking load and elongation of woven textile fabrics ( *second revision* ) |
| IS 2508 : 1984 | Specification for low density polyethylene films ( *second revision* ) |
| IS 6192 : 1984 | Specification for monoaxially oriented high density polyethylene tapes ( *first revision* ) |
| IS 9030 : 1979 | Method for determination of seam strength of jute fabrics including their laminates |
| IS 10789 : 1983 | Classification and terminology of stitch types used in seams |

### 3 MANUFACTURE

#### 3.1 Fabric

The fabric used in the manufacture of HDPE woven sacks shall be woven from HDPE tapes ( *see* IS 6192 : 1984 ). The minimum width of tapes used for making fabric shall be not less than 2·5 mm and the linear density of the tape shall be minimum 88·8 tex ( 800 denier ) for fabric woven on flat bed loom and 111 tex ( 1000 denier ) for fabric woven on circular loom.

#### 3.2 Sacks

The sacks may be produced from material woven as a tube on a circular loom and cut to the required length or converted from woven fabric produced on a flat bed loom.

**3.2.1** The constructional particulars of fabric suitable for conversion into sacks shall be as given below:

a) For L-stitched woven sacks ( on flat bed loom )

| | | |
|---|---|---|
| Ends/cm, *Min* | = | 5·5 ( with warp along width of sacks ) |
| Picks/cm, *Min* | = | 5·5 |
| Mass, g/m², *Min* | = | 98 |

b) For tubular woven sacks ( on circular loom )

| | | |
|---|---|---|
| Ends/cm, *Min* | = | 4 |
| Picks/cm *Min* | = | 4 |
| Mass, g/m², *Min* | = | 88 |

#### 3.3 Liner

The sacks shall be provided with a loose liner of LDPE with a suitable copolymer or any other material. The thickness of the loose liner, when tested in accordance to A-2 of IS 2508 : 1984, shall be 70 microns ± 10 percent. The width of the loose liner shall be 10 percent more than the dimensions of the sacks.

**3.3.1** The liner shall be free from pin holes, patches, tears, blisters and any other visible defects. The plastic material used for the liner shall be made from virgin material.

**3.3.2** The bottom seal of the loose liner should be at least 25 mm from the bottom edge.

#### 3.4 Lamination

If required by the buyer, the fabric woven on flat bed loom/circular loom before manufacture into sacks may be laminated with LDPE film of uniform thickness with a minimum mass of 23 g/m² + 10 percent.

3.4.1 The plastic material used for the lamination of the sacks shall be a virgin material.

### 3.5 Seam

In case of sacks fabricated out of the fabric woven on flat bed loom, the side and bottom seams of the sack shall be sewn, and in case of tubular woven sacks seam will be only at the bottom. The stitching shall be done with two rows of either lock stitch or chain stitch. The two rows of stitches should be separated from each other by about 5 mm and the outer row of stitching should be approximately 8 mm from the outer edge of the sack. In case of L-stitched sacks ( woven on flat bed loom ), the stitching shall be done with single fold over seam to a depth of 25 mm, so that the stitches pass through a minimum of four layers of the fabric. In case of tubular woven sacks (woven on circular loom ), the stitching shall be done with double fold over seam to a depth of 25 mm, so that the stitches pass through a minimum of six layers of the fabric. The number of stitches/dm shall be $14 \pm 2$. The lock or chain stitches may be as recommended in IS 10789 : 1983.

3.5.1 The material used for stitching shall be HDPE tape or any other thread suitable for the purpose, compatible to the product being packed in the sack. The HDPE tape used for stitching shall have at least 20 percent higher denier than that used for making of the sack. The stitching shall be uniform without any loose thread or knot.

### 3.6 Mouth of the Sack

The mouth of the sack should be selvedged, hemmed or heat-cut, so that the tapes do not fray. The mouth of the sack should be completely open.

### 3.7 Handles

If required by the buyer, Type 2 sacks shall be provided with handles, one on either side, so that the sacks can be conveniently carried like hand bags when filled. Each handle shall be made out of the same HDPE fabric as used for sacks. Fabric pieces measuring 100 × 300 mm shall be folded to make straps of 25 × 300 mm, which shall be stitched to the mouth of the bag.

### 3.8 Capacity

Type 1 sacks shall have nominal holding capacities of 25 kg and 50 kg and Type 2 sacks shall have nominal holding capacities of 5 kg and 10 kg.

## 4 REQUIREMENTS

4.1 The breaking strength of fabric and seam breaking strength of Type 1 and Type 2 sacks shall be as given in Table 1.

**Table 1 Requirements of HDPE Woven Sacks for Packing Pesticides**

( *Clause* 4.1 )

| Sl No. | Characteristic | Requirement N* *Min* | | Method of Test |
|---|---|---|---|---|
| | | Type 1 | Type 2 | |
| (1) | (2) | (3) | (4) | (5) |
| i) | Breaking strength of fabric on 5·0× 20 cm strips | | | |
| | a) Widthwise | 850 | 600 | IS 1969 : 1985 ( Ravelled strip test method only ) |
| | b) Lengthwise | 680 | 540 | |
| ii) | Seam breaking strength | | | |
| | a) Side seam | 390 | 540 | IS 9030 : 1979 |
| | b) Bottom seam | 310 | 200 | |

*1 N = 0·102 kgf approximately.

NOTE — Side seam breaking strength is not applicable for tubular woven sacks.

### 4.2 Dimensions

The outside dimensions shall be as agreed to between the buyer and the seller subject to a tolerance of $+ \begin{matrix} 20 \text{ mm} \\ - 10 \text{ mm} \end{matrix}$ for both width and length.

NOTES

1 Size of the sacks depends on bulk density of the material to be packed. However, for information suitable sizes for Type 1 and Type 2 are given below for guidance:

| *Capacity* | *Material* | *Size ( Width × Length )* |
|---|---|---|
| 5 kg | — | 280 × 380 mm |
| 10 kg | — | 380 × 460 mm |
| 25 kg | low bulk density | 510 × 810 mm |
| | high bulk density | 560 × 736 mm |
| 50 kg | low bulk density | 610 × 910 mm |
| | high bulk density | 560 × 910 mm |

2 These dimensions ensure optimum free space of minimum 20 percent of length when measured along the surface of the fabric from mouth stitch line of the sack up to the surface level of the contents.

### 4.3 Mass

The mass of the sack shall be as agreed to between the buyer and the seller or as declared by the manufacturer subject to the following tolerances:

| | *Tolerance* |
|---|---|
| a) On a bale of 500 sacks ( excluding packing material ) | ± 3 percent |
| b) On an individual sack | ± 6 percent |

**4.3.1** The method of calculating the mass of the sacks is given in Annex A for guidance.

## 5 MARKING AND PACKING

### 5.1 Marking

The sacks shall be marked with the information as required by the buyer using suitable inks.

NOTE — The common practice of marking involves use of silk screen or stencils for printing the matter when the number of sacks ordered is small. When large number of sacks are required, the normal accepted method is *flexo-printing*. The inks, found most suitable for printing are these based on polyamide resins. The shade of the inks should not vary from sack to sack.

### 5.2 Packing

500 sacks or multiples thereof shall be packed to form a bale; the bale formed using a layer of HDPE woven fabric or hessian and suitably secured.

## 6 SAMPLING AND CRITERIA FOR CONFORMITY

**6.1** In any consignment all the sack of the same construction shall be grouped together to constitute a lot.

**6.2** The conformity of the lot to the requirements of the standard shall be determined on the basis of the test carried out on the samples selected from it.

**6.3** Unless otherwise agreed to between the buyer and the seller the number of bales to be selected depends on the size of the lot and shall be in accordance with col 1 and 2 of Table 2. Also the number of sacks to be selected from the bale samples shall be in accordance with col 4 of Table 2 for visual, dimensional and mass requirements and shall be in accordance with col 8 of Table 2 for breaking load requiretmens.

### 6.4 Number of Tests and Criteria for Conformity

**6.4.1** *Visual, Dimensional and Mass Requirement*

Test for the visual, dimensional and mass requirements ( **3.1** to **3.7** and **4.1** ), excluding breaking load requirements for ascertaining the conformity of the lot shall be made on the sample sacks selected in one or two stages as the case may be ( *see* Table 2 ).

**6.4.1.1** The samples sacks selected in the first stage shall be examined for various requirements specified. Any sack failing to satisfy one or more requirements shall be termed as defective. If the number of defectives in the first stage is less than or equal to the acceptance number ( *A* ) given in col 6 of Table 2 the lot shall be accepted. If the number of defectives is equal to or greater than the rejection number ( *r* ) given in col 7 of Table 2 the lot shall be rejected. If it lies between ( *A* ) and ( *r* ) for the first stage, a second sample of size given in col 3 of Table 2 shall be added, if this cumulative number is less than or equal to the acceptance number for the second stage, the lot shall be accepted. If the cumulative number of defectives is equal to or greater than the corresponding rejection number, the lot shall be rejected without further testing.

**6.4.2** *Breaking Load Requirements*

Test for the breaking load requirement ( **4.1** ) for ascertaining the conformity of the lot shall be made on the sample sacks selected in one or two stages as the case may be ( *see* Table 2 ).

**6.4.2.1** The samples selected and tested shall be as per the procedure followed in **6.4.1.1.** However, the acceptance number ( *A* ) shall be as given in col 10 of Table 2 and the rejection number ( *r* ) shall be as given in col 11 of Table 2.

**Table 2 Sample Size and Criteria for Conformity**

( *Clauses* 6.3, 6.4 *and* 6.4.1.1 )

| No. of Bales in the Lot | No. of Bales to be Sampled | | Visual, Dimensional and Mass Requirements | | | | Strength Requirements | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample Size ( sacks ) | Cumulative Sample ( sacks ) | *A* | *r* | Sample Size ( sacks ) | Cumulative Sample ( scaks ) | *A* | *r* |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| Up to 25 | 3 | I stage | 13 | 13 | 0 | 3 | 8 | 8 | 0 | 1 |
| | | II stage | 13 | 26 | 3 | 4 | — | — | — | — |
| 26 to 50 | 5 | I stage | 20 | 20 | 1 | 4 | 8 | 8 | 0 | 1 |
| | | II stage | 20 | 40 | 4 | 5 | — | — | — | — |
| 51 to 100 | 8 | I stage | 32 | 32 | 2 | 5 | 13 | 13 | 0 | 2 |
| | | II stage | 32 | 64 | 6 | 7 | 13 | 26 | 1 | 2 |
| 101 and above | 12 | I stage | 50 | 50 | 3 | 7 | 20 | 20 | 0 | 3 |
| | | II stage | 50 | 100 | 8 | 9 | 20 | 40 | 3 | 4 |

# ANNEX A

( *Clause* 4.3.1 )

## METHOD FOR CALCULATION OF MASS OF SACKS

### A-1 CALCULATION OF MASS OF SACKS

**A-1.1** Total mass of sacks comprises of (a) mass of fabric; (b) stitching tape or threads, and (c) mass of lamination, if required by the buyer.

**A-1.1.1** Calculate the mass of sacks with the help of the following formulae as the case may be:

a) Mass of fabric, g

i) Mass of flat woven fabric, g $= (l + 25\text{ mm}) \times 2\ (w + 25\text{ mm}) \times M \times 10^{-6}$

ii) Mass of tubular fabric, g $= (l + 50\text{ mm}) \times 2w \times M \times 10^{-6}$

b) Mass of stitching tape or thread, g $= l_1 \times t \times 10^{-6}$

c) Mass of lamination, g ( if required by the buyer ) $= (l + 25\text{ mm}) \times 2\ (w + 25^{*}\text{ mm}) \times M_1 \times 10^{-6}$

where

$l$ = length of sack in mm;

$l_1$ = approximate length of stitching tape or thread in mm;

$w$ = width of sack in mm;

$M$ = mass of fabric in g/m$^2$;

$t$ = linear density of stitching tape in tex; and

$M_1$ = mass of lamination in g/m$^2$.

NOTE — For Type 2 sacks, the mass of the fabric used for sack handle ( 3.7 ) requires to be added while calculating the mass of the sack.

* Applicable only for flat bedloom fabric.

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**AMENDMENT NO. 1 NOVEMBER 1990**
**TO**
**IS 8069:1989 HIGH DENSITY POLYETHYLENE (HDPE) WOVEN SACKS FOR PACKING PESTICIDES - SPECIFICATION**

(Second Revision)

[Page 2, Table 1, col 4, against Sl No. (ii) (a)] - Substitute '250' for '540'.

(TXD 23)

Reprography Unit, BIS, New Delhi, India